Books and Software for Rust Backend Development, Python, and AI

# 📘 Rust and Axum (Backend)

* 1. The Rust Programming Language (by Steve Klabnik and Carol Nichols) – Rust fundamentals
* 2. Programming Rust (by Jim Blandy and Jason Orendorff) – Deeper dive into systems programming
* 3. Zero To Production In Rust (by Luca Palmieri) – Best book for building web backends with Rust (uses Actix, concepts apply to Axum)
* 4. Axum Official Docs (https://docs.rs/axum) – Best resource for real-world examples and APIs
* 5. Rust Web Development (Packt) – Covers web APIs, JSON, and more

# 🛢️ Databases with Rust

* 6. SQLx Book (https://docs.rs/sqlx) – Async SQL with compile-time checks
* 7. SeaORM Book (https://www.sea-ql.org/SeaORM) – Async ORM for Rust
* 8. Diesel Book (https://diesel.rs/guides/) – Strong static typing for SQL queries
* 9. Database Internals (by Alex Petrov) – Learn how databases work under the hood

# 🐍 Python Programming and AI

* 10. Automate the Boring Stuff with Python (by Al Sweigart) – Beginner-friendly Python
* 11. Python Crash Course (by Eric Matthes) – Comprehensive Python fundamentals
* 12. Fluent Python (by Luciano Ramalho) – Deep dive into Pythonic patterns
* 13. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow (by Aurélien Géron) – Practical ML guide
* 14. Deep Learning with Python (by François Chollet) – Neural networks and deep learning (Keras creator)
* 15. Make Your Own Neural Network (by Tariq Rashid) – Good beginner AI book

# 🧠 Learning AI & Machine Learning for Backend

* 16. Grokking Deep Learning (by Andrew Trask) – Gentle intro to AI logic
* 17. Machine Learning Yearning (by Andrew Ng – Free PDF) – Practical AI product development
* 18. YouTube Playlists: freeCodeCamp.org, Sentdex, and 3Blue1Brown (for visual understanding of AI concepts)

# 💻 Essential Software & Tools

* • Rust Toolchain (install via rustup)
* • Cargo (Rust package manager)
* • Visual Studio Code (with rust-analyzer & Python extensions)
* • Postman or Insomnia (for testing APIs)
* • Docker (for containerization and deployment)
* • PostgreSQL or MySQL (relational databases)
* • PgAdmin or DBeaver (GUI for databases)
* • Python 3 (from python.org)
* • Jupyter Notebook (for AI/ML experiments)
* • Git and GitHub (version control and project collaboration)
* • Poetry or Pipenv (Python dependency management)